

# RMC 7189

1U Rackmount System

## User Manual

*RMC7189*: 1U Rackmount Computer comes with  
Intel Xeon X5600/E5600/L5600 series processor  
Intel Xeon X5500/E5500/L5500 series processor



# RMC 7189

## 1U Rackmount System

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## **Preface**

### **About This Manual**

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the Acnodes RMC7189. Installation and maintenance should be performed by experienced technicians only.

## **Manual Organization**

### **Chapter 1: Introduction**

The first chapter provides a checklist of the main components included with the server system and describes the main features of the embedded board and the RMC7189 chassis.

### **Chapter 2: Server Installation**

This chapter describes the steps necessary to install the Acnodes RMC7189 into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

### **Chapter 3: System Interface**

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

### **Chapter 4: System Safety**

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the Acnodes RMC7189.



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### **Chapter 5: Advanced Motherboard Setup**

Chapter 5 provides detailed information on the embedded board, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

### **Chapter 6: Advanced Chassis Setup**

Refer to Chapter 6 for detailed information on the RMC7189 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring drives and when replacing system power supply units and cooling fans.

### **Chapter 7: BIOS**

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

### **Appendix A: POST Error Beep Codes**

### **Appendix B: Installing the Windows OS**

### **Appendix C: System Specifications**



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## Appendix A POST Error Beep Codes

## Appendix B Installing the Windows

## Appendix C System Specifications





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## CHAPTER 1 INTRODUCTION

### 1.1 Overview

The Acnodes RMC7189 is a high-end single processor, 1U rack-mount server. The RMC7189 is comprised of two main subsystems: the RMC7189 chassis and the embedded board. Please refer to our web site for information on operating systems that have been certified for use with the RMC7189.

In addition to the mainboard and chassis, various hardware components may have been included with the RMC7189, as listed below.

- o One slim DVD-ROM drive
- o One mini USB to SATA adapter
- o Four sets of 4-cm counter-rotating fans
- o One air shroud
- o One DVD-ROM drive cable
- o One internal USB cable for DVD drive
- o Two passive CPU heatsinks
- o Riser Cards: (see Section 5-6 for details) One RSC-R1UU-UE16 for PCI-E card
- o Hard Drive Accessories
- One SAS/SATA backplane
- Two SAS/SATA iPASS cables
- Eight SAS/SATA drive carriers
- o One rackmount kit
- o One CD containing drivers and utilities
- o AcnodesRMC7189 User's Manual



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## 1-2 Serverboard Features

At the heart of the Acnodes RMC7189 lies the embedded system, a dual processor serverboard based on the Intel® IOH-36D + ICH10R chipset. Below are the main features of the embedded system (See Figure 1-1 for a block diagram of the chipset).

### Processor

The RMC7189 supports single or dual two Intel® 5500 Series processors in LGA1366 sockets. Please refer to our web site for a complete listing of supported processors

### Memory

The RMC7189 has 240-pin DIMM sockets that can support up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM. Please refer to Chapter 5 for installing memory.

### UIO

The RMC7189 is a specially-designed serverboard that features Acnodes's UIO (Universal I/O) technology. UIO serverboards have a PCI Express x8 slot that can support any one of several types of UIO card types to add SAS ports, additional LAN ports, etc. to the serverboard. This allows the user to tailor the serverboard to their own needs.

Note: the server does not come with a UIO card installed.

### Onboard SATA

An on-chip (ICH10R) SATA controller is integrated into the RMC7189 to provide a six-port, 3 Gb/sec SATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units.

Note: You must have RAID set up to enable the hot-swap capability of the SATA drives. Documentation on RAID setup guidelines can be found on our web site.

### Onboard Controllers/Ports

An onboard IDE controller supports one floppy drive. Onboard I/O backpanel ports include one COM port, a VGA port, two USB ports, PS/2 mouse and keyboard ports and two Gigabit LAN (NIC) ports.

### Graphics Controller

The RMC7189 features an integrated Matrox G200eW graphics chip, which includes 8 MB of DDR2 memory.



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## Other Features

Other onboard features that promote system health include voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

## 1-3 Server Chassis Features

The RMC7189 features eight 2.5" hard drive bays and high-efficiency power supplies. The RMC7189 is built upon the embedded system chassis while the RMC7189 is built upon the embedded system chassis. Details on the chassis and on servicing procedures can be found in Chapter 6. The following is a general outline of the main features of both chassis.

### System Power

The RMC7189 features a redundant 650W power supply consisting of two power modules. The system does not need to be shut down when replacing or removing a single power supply module.

The RMC7189 features a single 560W power supply module. The system must be shut down when replacing or removing this power supply module.

### PCI Expansion Slots

A riser card on the right side of the chassis can support AOC-PG-i2+ add-on card to provide two Gb LAN ports. The left side supports a UIO card and one PCI-E x16 card. These two systems can support four SAS/ SATA drives with an optional UIO SAS card.

See page 5-10 for details. (Right and left refer to the side when viewed from the front of the system.)

### Control Panel

The SC113 control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and a UID (Universal Information) LED. Also present are a main power button, a system reset button and a UID button.

### I/O Backplane

The RMC7189 is a 1U rackmount chassis. Its I/O backplane provides three standard size PCI slots, one COM port, one VGA port, two USB ports, PS/2 mouse and keyboard ports, two Ethernet (LAN) ports, one dedicated IPMI LAN port and a UID LED.

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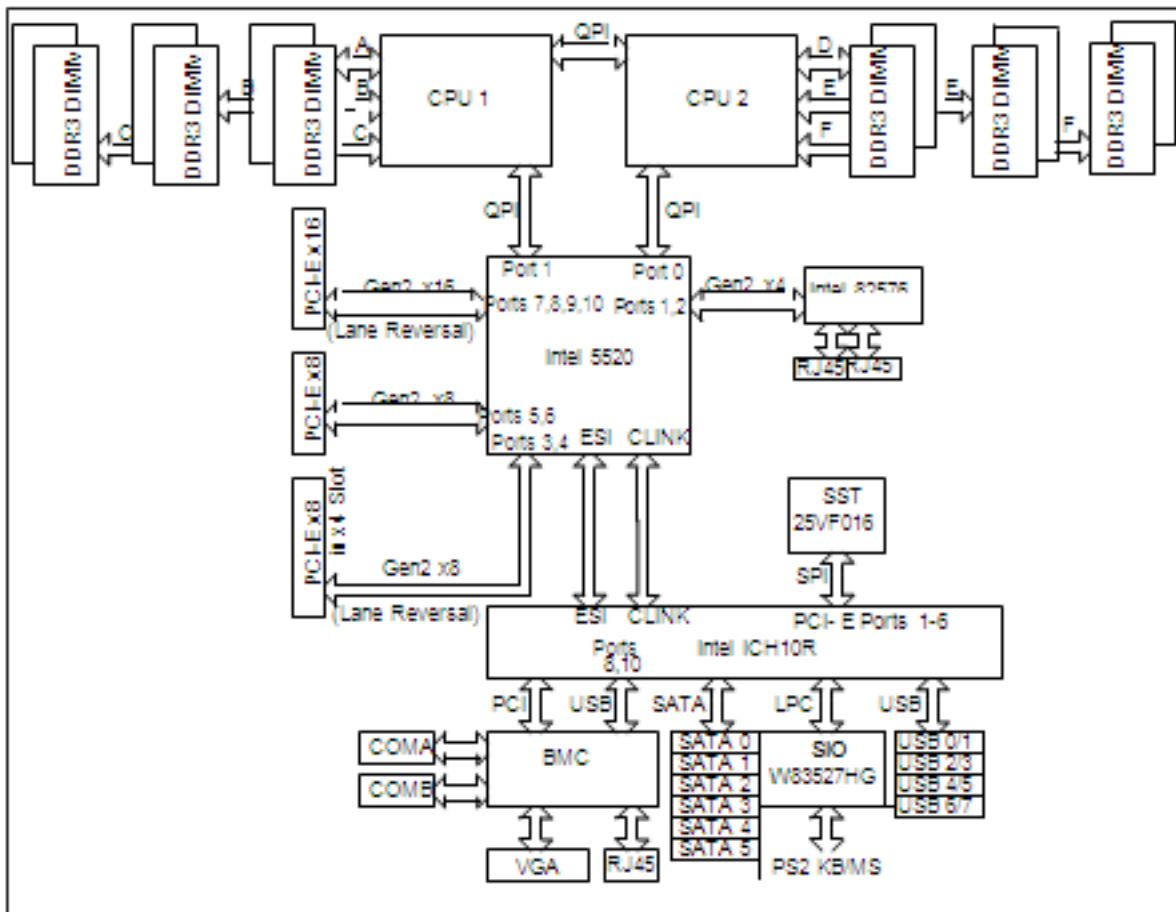
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## Cooling System

The RMC7189 chassis' revolutionary cooling design has been optimized to provide sufficient cooling for dual CPU configurations. The chassis includes an air shroud and four 4-cm counter-rotating fans located in the middle of the chassis. There is a "Fan Speed Control Mode" in BIOS that allows chassis fan speed to be determined by system temperature.

Figure 1-1. System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.





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## CHAPTER 2 INSTALLATION

### 2-1 Overview

This chapter provides a quick setup checklist to get your Acnodes RMC7189 and running. Following the steps in the order given should enable you to have the system operational within a minimal amount of time. This quick setup assumes that your RMC7189 system has come to you with the processor and memory preinstalled. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

### 2-2 Unpacking the System

You should inspect the box the Acnodes RMC7189 was shipped in and note if it was damaged in any way. If the server itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the Acnodes RMC7189. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

### 2-3 Preparing for Setup

The box the RMC7189 was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

### Choosing a Setup Location

- o Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing. This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets, etc.).

- o This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

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## Warnings and Precautions!



### Rack Precautions

- o Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- o In a single rack installation, stabilizers should be attached to the rack.
- o In multiple rack installations, the racks should be coupled together.
- o Always make sure the rack is stable before extending a component from the rack.
- o You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

### Server Precautions

- o Review the electrical and general safety precautions in Chapter 4.
- o Determine the placement of each component in the rack before you install the rails.
- o Install the heaviest server components on the bottom of the rack first, and then work up.
- o Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- o Allow the power supply units and hot plug Serial ATA drives to cool before touching them.
- o Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.



A blue-tinted photograph of a server rack with various components and cables. The image is partially obscured by a light blue curved shape on the right side.

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## Rack Mounting Considerations

### Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature ( $T_{mra}$ ).

### Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

### Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

### Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).



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### 2-4 Installing the System into a Rack

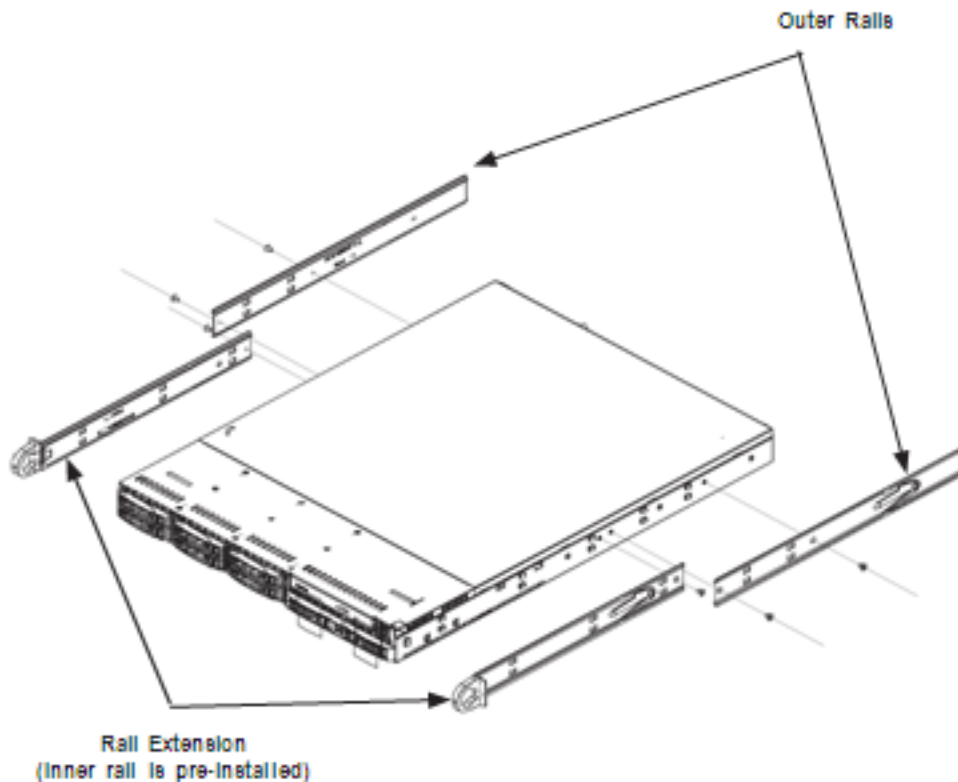
This section provides information on installing the Acnodes RMC7189 into a rack. If the system has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. Note: This rail will fit a rack between 26" and 33.5" deep.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the RMC7189 into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

#### Identifying the Sections of the Rack Rails

Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Figure 2-1. Identifying the Sections of the Rack Rails



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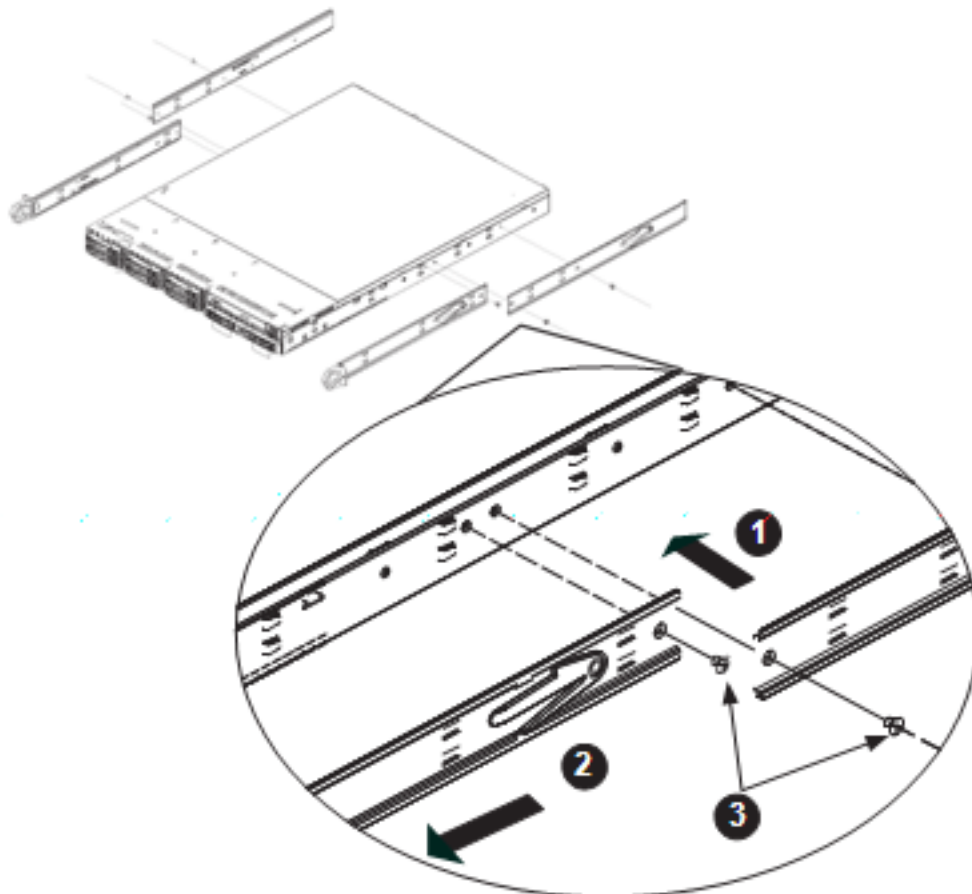
## Inner Rails

The motherboard chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack.

## Installing the Rack Rails

1. Place the inner rack extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.
2. Slide the extension toward the front of the chassis.
3. Secure the chassis with two screws as illustrated.
4. Repeat steps 1-3 for the other inner rail extension.

Figure 2-2. Installing Chassis Rails



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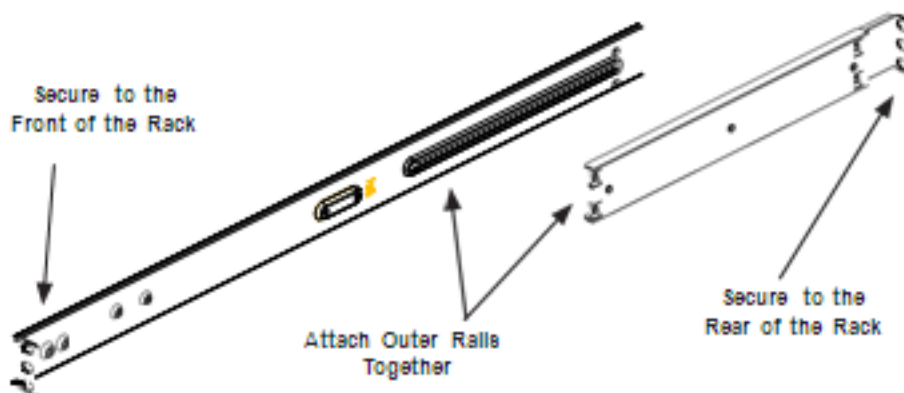
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### Outer Rails

Installing the Outer Rails to the Rack

1. Attach the short bracket to the outside of the long bracket. You must align the pins with the slides. Also, both bracket ends must face the same direction.
2. Adjust both the short and long brackets to the proper distance so that the rail fits snugly into the rack.
3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.
4. Repeat steps 1-4 for the left outer rail.

Figure 2-3. Assembling the Outer Rails



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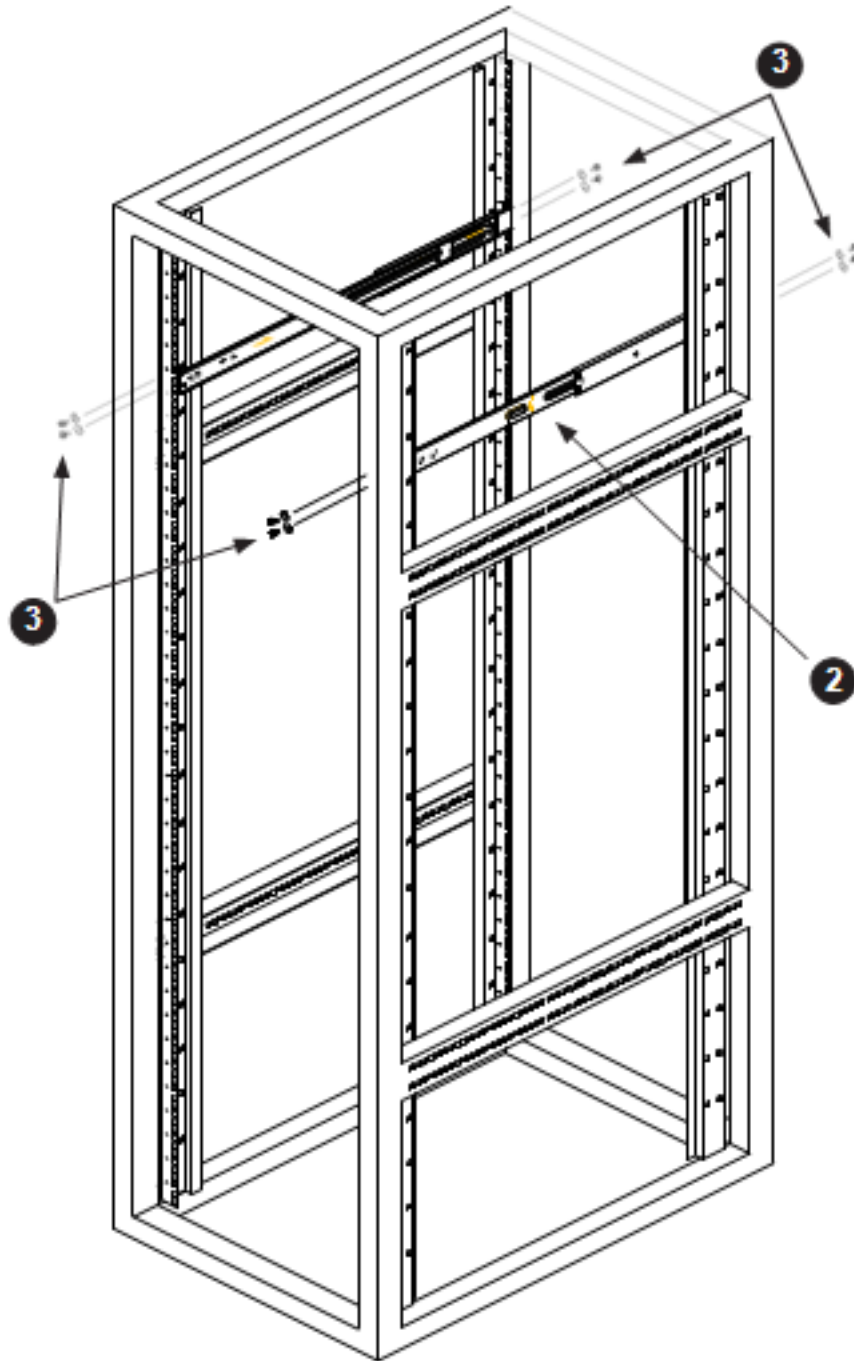


Figure 2-4. Installing the Outer Rails to the Rack

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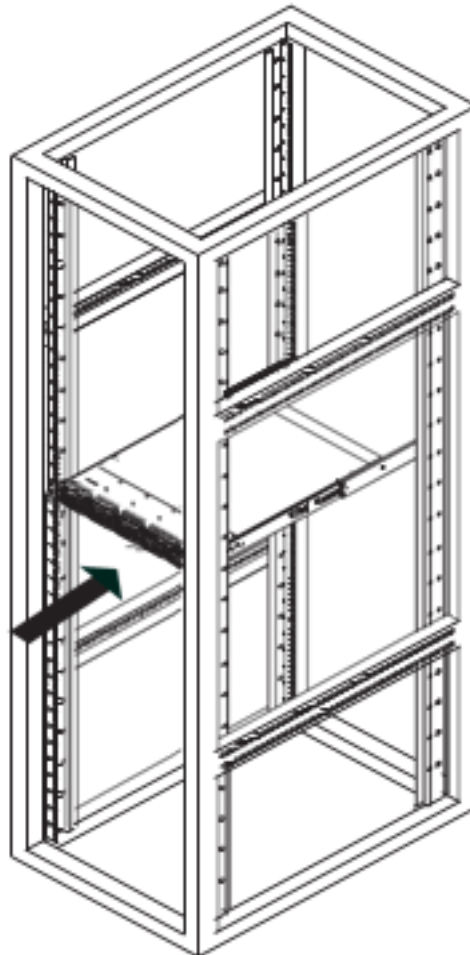
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### Installing the Chassis into a Rack

1. Confirm that chassis includes the inner rails and rail extensions . Also, confirm that the outer rails are installed on the rack.
2. Line chassis rails with the front of the rack rails.
3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the server has been pushed completely into the rack, you should hear the locking tabs "click".
4. (Optional) Insert and tightening the thumbscrews that hold the front of the server to the rack.

Figure 2-5. Installing the Server into a Rack



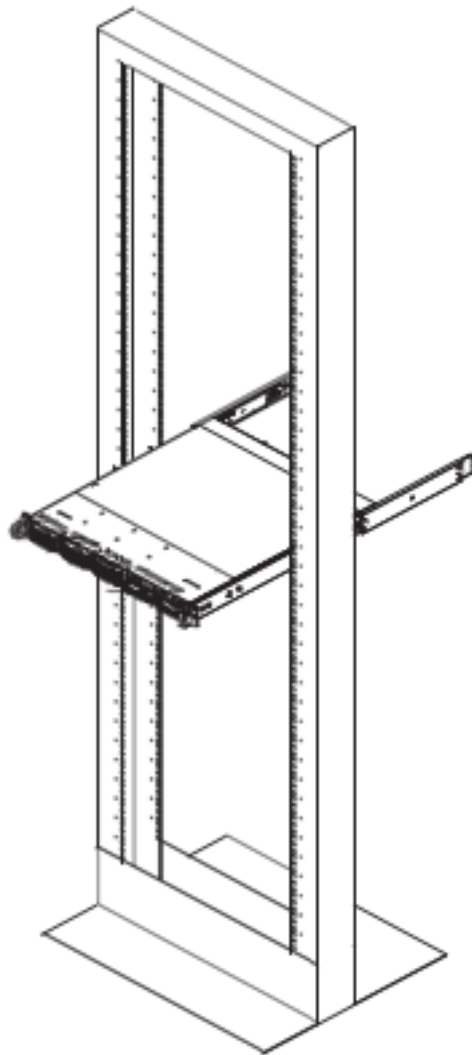
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## Installing the Server into a Telco Rack

To install the Acnodes RMC7189 into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far follow the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-6. Installing the Server into a Telco Rack





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## 2-5 Checking the Motherboard Setup

After you install the server in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

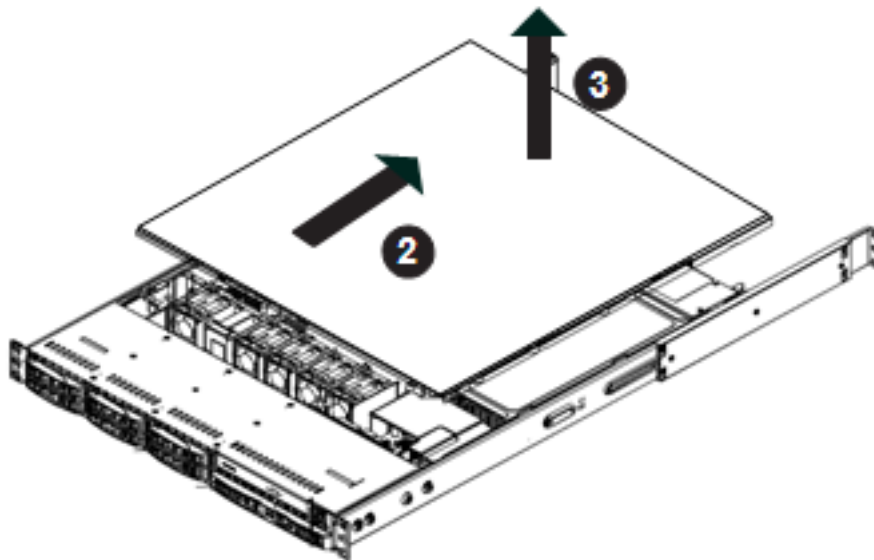
### Removing the Chassis Cover (Figure 2-5)

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").
2. Remove the screws securing the top cover to the chassis.
3. Slide the cover toward the rear of the chassis.
4. Lift the cover off the chassis.

### Checking the Components

1. You should have one or two processors already installed into the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

Figure 2-5: Removing the Chassis Cover







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2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.
3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.
4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the serverboard area of the chassis.

## 2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the Serial ATA drives and Serial ATA backplane have been properly installed and all essential connections have been made.

### Checking the Drives

1. For servicing the hard drives, you will need to remove the top chassis cover.
2. If you need to remove or install hard drives, please refer to Chapter 6.

### Checking the Airflow

1. Airflow is provided by four 4-cm counter-rotating fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.
2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

### Providing Power

1. The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).
2. Finish by depressing the power button on the chassis control panel.

## CHAPTER 3 SYSTEM INTERFACE

### 3-1 Overview

There are several LEDs on the control panel to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the control panel. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

### 3-2 Control Panel Buttons

There are two push buttons located on the front of the chassis: a reset button and a power on/off button.

RESET



**Reset Button**

The reset button reboots the system.



**Power**

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system. If you need to service the system you should unplug the AC power cord after shutting down the server.



**UID**

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function. See the table in Figure 3-1 for descriptions of UID LED states.

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## 3-3 Control Panel LEDs

The control panel located on the front of the chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



### Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. This LED will be blue when used for UID (Unit Identifier). When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists. See the table below for descriptions of the LED states.

Figure 3-1. Universal Information LED States

Universal Information LED States	
State	Indication
Fast Blinking Red (1x/sec)	Fan Fail
Solid Red	CPU Overheat
Slow Blinking Red (1x/4 sec)	Power Fall (1025W-UR only)
Solid Blue	Local UID Button Depressed
Blinking Blue	IPMI-Activated UID

**Note:** deactivating the UID LED must be performed in the same way it was activated. IPMI is not supported on the X7SB3.

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NIC2

Indicates network activity on LAN2 when flashing .



NIC1

Indicates network activity on LAN1 when flashing.



HDD

Channel activity for all HDDs. This light indicates IDE or SATA drive activity when flashing.



Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

The image shows a close-up of a server rackmount system with various components and cables. The background is a solid blue color with a light blue curved shape on the right side.

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## 3-4 HardDrive Carrier LEDs

Each Serial ATA drive has both a green and a red LED.

- o **Green:** Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

- o **Red:** The red LED to indicate an SATA drive failure. If one of the SATA drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

## CHAPTER 4 SYSTEM SAFETY

### 4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the Acnodes RMC7189 from damage:

- o Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- o Do not work alone when working with high voltage components.
- o Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.
- o When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- o Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- o Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- o The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

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- o Motherboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- o DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.
- o Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

## 4-2 General Safety Precautions



Follow these rules to ensure general safety:

- o Keep the area around the RMC7189 clean and free of clutter.
- o The RMC7189 weighs approximately 37 lbs (16.8 kg). When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- o Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- o While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- o Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.



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o After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

### 4-3 ESD Precautions



Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- o Use a grounded wrist strap designed to prevent static discharge.
- o Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- o Touch a grounded metal object before removing the board from the antistatic bag.
- o Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- o Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- o When handling chips or modules, avoid touching their pins.
- o Put the motherboard and peripherals back into their antistatic bags when not in use.
- o For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

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### 4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the RMC7189 is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

## CHAPTER 5

# ADVANCED SERVERBOARD SETUP

This chapter covers the steps required to install processors and heatsinks to the RMC7189 serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

### 5-1 Handling the Motherboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

#### Precautions

- o Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- o Touch a grounded metal object before removing any board from its antistatic bag.
- o Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- o When handling chips or modules, avoid touching their pins.
- o Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- o For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

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## Unpacking

The motherboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

## 5-2 Processor and Heatsink Installation

When handling the processor, avoid placing direct pressure on the label area of the fan. Also, do not place the serverboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

o Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

o If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.

o Make sure to install the serverboard into the chassis before you install the CPU heatsinks.

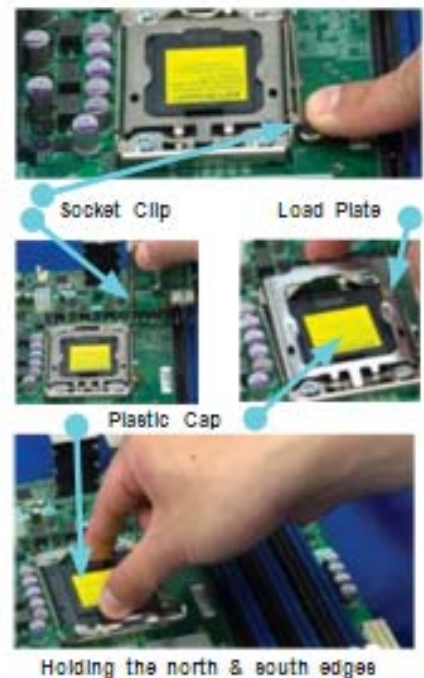
o When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.

o Refer to the Supermicro web site for updates on CPU support.

### Installing an LGA1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locked position.
2. Gently lift the socket clip to open the load plate.
3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

**Note:** The photos on this page and succeeding pages are for illustration purposes only. They do not necessarily reflect the exact product(s) described in this manual.



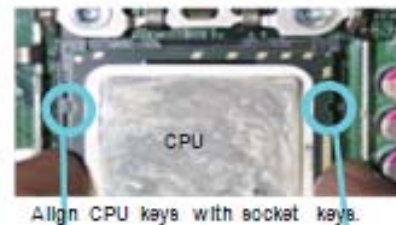
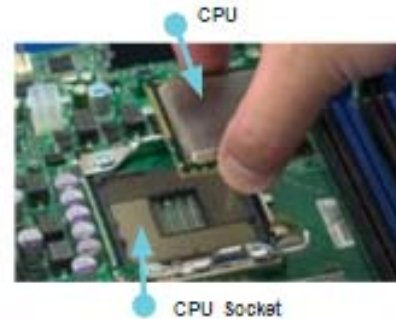


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## 1U Rackmount System

1. After removing the plastic cap, use your thumb and the index finger to hold the CPU at the north and south center edges.
2. Align the CPU key (the semi-circle cutout) with the socket key (the notch below the gold color dot on the side of the socket).
3. Once the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.
4. With the CPU in the socket, inspect the four corners of the CPU to make sure that it sits level and is properly installed.
5. Once the CPU is securely seated in the socket, lower the CPU load plate to the socket.
6. Use your thumb to gently push the socket clip down to the clip lock.

Important! Please save the plastic cap. The motherboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed may cause damage to the socket pins.



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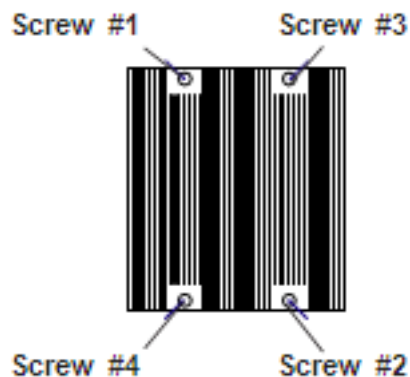
1U Rackmount System

## Installing the Heatsink

1. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
2. Remove the thin layer of protective film from the copper core of the heatsink.

**Warning:** The CPU may overheat if the protective film is not removed from the heatsink.

3. Apply the proper amount of thermal grease on the CPU. If your heatsink came with a thermal pad, please ignore this step.
4. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)
5. Finish the installation by fully tightening all four screws.



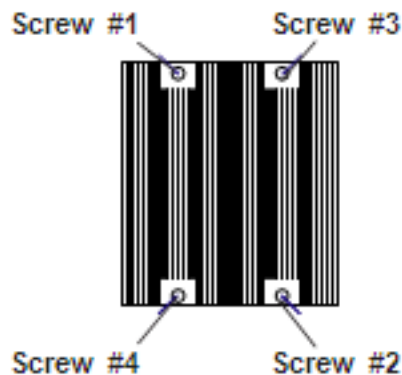
# RMC 7189

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## Removing the Heatsink

**Warning:** We do not recommend that the CPU or the heatsink be removed. However, if you do need to remove the heatsink, please follow the instructions below prevent damage to the CPU or other components.

1. Unplug the power cord from the power supply.
1. Unscrew and remove the heatsink screws in the sequence shown in the picture below.
2. Hold the heatsink and gently wiggle it to loosen it from the CPU. (Do not use excessive force when doing this!)
3. Once the heatsink is loosened, remove it from the CPU.
4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re- install the heatsink.







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## 5-3 Connecting Cables

Now that the motherboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

### Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the motherboard layout for connector locations.)

- o DVD-ROM drive cable (SATA4)
- o SATA cables (SATA0 ~ SATA3)
- o Control Panel cable (JF1, see next page)

### Connecting Power Cables

The embedded system has a 20-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. Connect the appropriate connector from the power supply to JPW1 to supply power to the serverboard. See the Connector Definitions section in this chapter for power connector pin definitions.

In addition, your power supply must be connected to the 8-pin Processor Power connectors at JPW2 and JPW3.

### Connecting the Control Panel

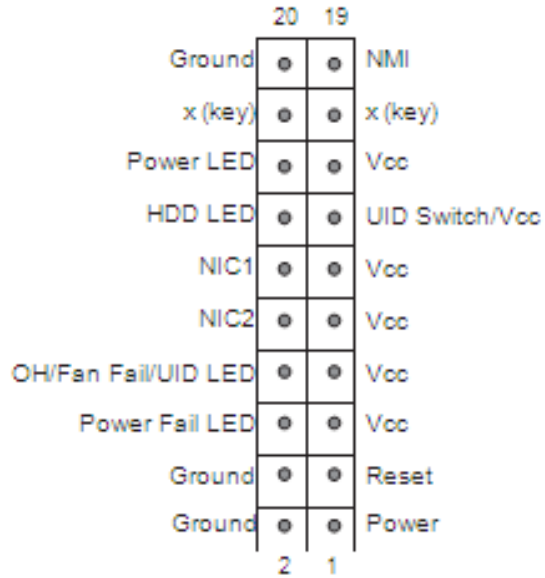
JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

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## 1U Rackmount System

Figure 5-1. Front Control Panel Header Pins (JF1)



### 5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



Rear I/O Ports	
1. Keyboard	8. COM1
2. PS/2 Mouse	7. VGA Port
3. USB0	8. LAN1
4. USB1	9. LAN2
5. IPMI LAN	10. UID Button

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### 5-5 Installing Memory Modules

#### CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

#### Installing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with slot P1-DIMM1A. For best performance, install memory modules of the same type and same speed in the slots as indicated in the tables below.
2. Insert each DIMM vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly (see Figure 5-5).
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules

#### Memory Support

The embedded system supports up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM in 12 slots. (RDIMM modules are supported.)

**Notes:** Memory speed support depends on the type of CPU used. Due to OS limitations, some operating systems may not show more than 4 GB of memory. Due to memory allocation to system devices, memory remaining available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (Refer to the Memory Availability Table below for details.)

Memory Population for Optimal Performance With One CPU (CPU1) Installed						
	Branch 0		Branch 1		Branch 2	
3 DIMMs	P1 DIMM1A		P1 DIMM2A		P1 DIMM3A	
6 DIMMs	P1 DIMM1A	P1 DIMM1B	P1 DIMM2A	P1 DIMM2B	P1 DIMM3A	P1 DIMM3B

Memory Population for Optimal Performance With One CPU (CPU2) Installed						
	Branch 0		Branch 1		Branch 2	
3 DIMMs	P2 DIMM1A		P2 DIMM2A		P2 DIMM3A	
6 DIMMs	P2 DIMM1A	P2 DIMM1B	P2 DIMM2A	P2 DIMM2B	P2 DIMM3A	P2 DIMM3B

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Memory Population for Optimal Performance With Two CPUs Installed												
	CPU1						CPU2					
	Branch 0		Branch 1		Branch 3		Branch 0		Branch 1		Branch 3	
6 DIMMs	1A		2A		3A		1A		2A		3A	
12 DIMMs	1A	1B	2A	2B	3A	3B	1A	1B	2A	2B	3A	3B

Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to System BIOS & OS applications		2.84

DIMM Population Table				
DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type (Reg.= Registered)	Speeds (In MHz)	Ranks per DIMM (any combination; 1R=Single Rank, 2R=Dual Rank, 4R=Quad Rank)
2	1	Reg. DDR3 ECC	800,1066,1333	1R or 2R
2	1	Reg. DDR3 ECC	800,1066	4R
2	2	Reg. DDR3 ECC	800,1066	Mixing 1R, 2R
2	2	Reg. DDR3 ECC	800	Mixing 1R, 2R, 4R

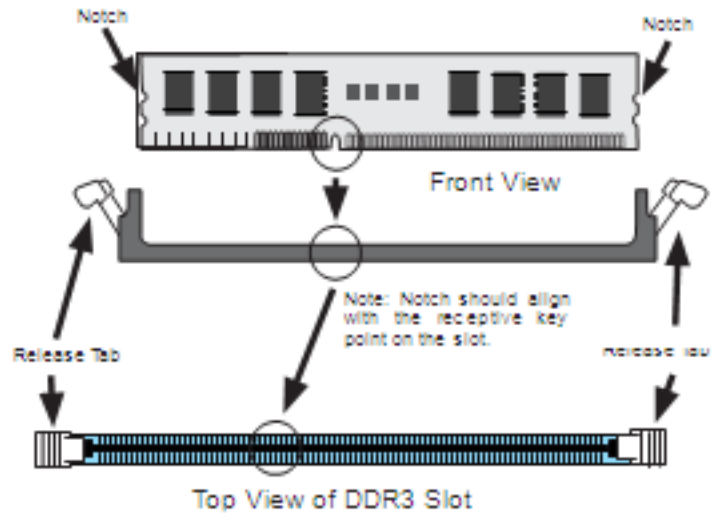
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Figure 5-3. Installing DIMM into Slot

**To Install:** Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

**To Remove:** Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.





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## 1U Rackmount System

## 5-6 Adding PCI Cards

### PCI Expansion Slots

Riser cards are used to support add-on cards to the system. See the tables below for the expansion cards that may be used in the serverboard chassis.

### PCI Card Installation

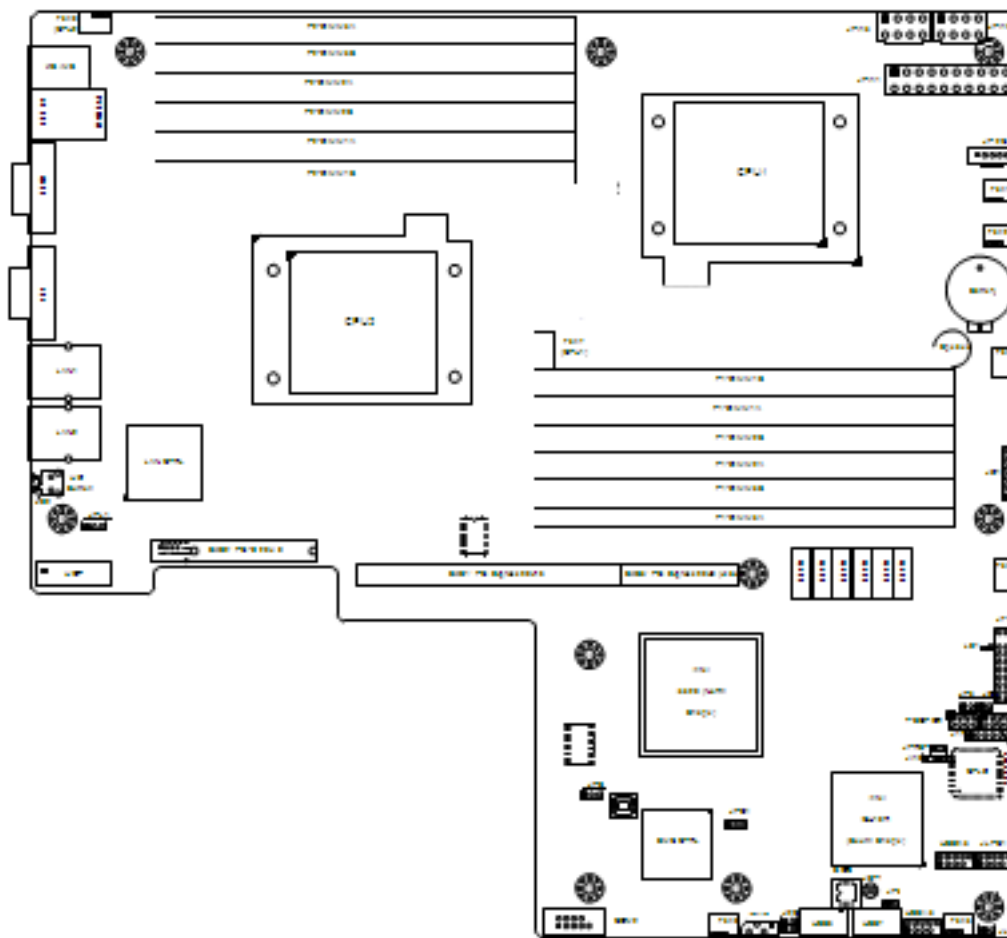
Before installing a PCI add-on card, make sure you install it into the correct riser card. Begin by releasing the locking tab that corresponds to the slot you wish to populate. Insert the expansion card into the correct riser card, pushing down with your thumbs evenly on both sides of the card.

PCI Slot/Card Configurations	
Left Side Riser Card	Expansion Card Supported
RBC-R1UUUE16 (pre-installed)	1x UID card and 1x PCIe x16 card
RBC-R1UUH8PR (optional)	AOC-PG12+ for 2x LAN ports

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## 5-7 Serverboard Details



### Notes:

Jumpers not indicated are for test purposes only.

When LE1 LED is on, the onboard power connection is on. Make sure to unplug the power cables before removing or installing components.

IPMI (Intelligent Platform Management Interface) 2.0 is supported by the embedded system.

### Warning

To provide adequate power to the add-on cards installed on the serverboard, please connect the UIOP PWR connector to the power supply for these cards to work properly.



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## Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-9)
JPC1/JPC2	SMB to PCI-Exp. Slots	Open (Disabled)
JP3	ME Mode Select	Open (Normal)
JP5	ME Recovery	Open (Normal)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1/2 Enable/Disable	Pins 1-2 (Enabled)
JPRST1	BMC/PHY Reset Enable/Disable	Open (Normal)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1/COM2	Serial Port/Header
FAN 1-8	Chassis/CPU Fan Headers
Floppy	Floppy Disk Drive Connector
IPMB	IPMB I <sup>2</sup> C Header (for an IPMI Card)
I-SATA0 ~ I-SATA5	SATA Ports
JD1	Onboard Speaker/Power LED
JF1	Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat Warning Header
JPI <sup>2</sup> C	Power Supply SMBus I <sup>2</sup> C Header
JPW1	20-Pin ATX Power Connector
JPW2/JPW3	8-pin Processor Power Connectors
LAN1/2	Gigabit Ethernet (RJ45) Ports
IPMI_LAN	IPMI 2.0 Dedicated LAN
T-SGPIO-1/T-SGPIO-2	Serial General Purpose Input/Output Headers
UIOP	UIO Card Power Supply Header
USB0/1, USB6, USB7	Universal Serial Bus (USB) Ports
USB2/3, USB4/5	Universal Serial Bus (USB) Headers

LED	Description
LE1	Onboard Standby PWR warning LED Indicator
LE2	Unit Identification (UID) LED

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## 5-8 Connector Definitions

### ATX Power Supply Connector

The primary ATX power supply connector meets the SSI EPS 12V specification. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

ATX Power 20-pin Connector Pin Definitions (JPW1)			
Pin#	Definition	Pin#	Definition
11	PB On	1	Ground
12	5VSB	2	Ground
13	Ground	3	Ground
14	Ground	4	Ground
15	Ground	5	Ground
16	NC2	6	NC1
17	12V	7	12V
18	12V	8	12V
19	12V	9	12V
20	12V	10	12V

### Processor Power Connector

JPW2 and JPW3 must also be connected to the power supply to provide power for the processor(s). See the table on the right for pin definitions.

Processor Power Pin Definitions (JPW2/JPW3)	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

**Warning:** To prevent damage to your power supply or serverboard, please use a power supply that contains a 20-pin and two 8-pin power connectors. Be sure to connect these power connectors to the 20-pin and the two 8-pin power connectors on your serverboard for adequate power supply to your system. Failure to do so will void the manufacturer warranty on your power supply and serverboard.

### NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

### Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	Vcc
16	Control

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## HDD LED

The HDD (IDE Hard Disk Drive) LED connection is located on pins 13 and 14 of JF1. Attach the IDE hard drive LED cable to display disk activity. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

## NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF1. Attach the NIC2 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Vcc
12	Ground

## NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF1. Attach the NIC1 LED cable to display network activity. Refer to the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Vcc
10	Ground

## Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED to pins 7 and 8 of JF1 to provide advanced warning of chassis overheating or fan failure. These pins also work with the front UID indicator, which will activate as either a solid or flashing blue LED depending on whether the LED was activated via IPMI or the UID button. Refer to the tables on the right for pin definitions and status indicators.

Universal Info. LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Control

Red LED Indications	
State	Indication
Solid	Overheat
Blinking (fast)	Fan Fail
Blinking (slow)	Power Fail

Blue LED Indications	
State	Indication
Solid	UID (via Button)
Blinking	UID (via IPMI)

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## Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	Vcc
6	Ground

## Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

## Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

## Universal Serial Bus Ports

Two Universal Serial Bus ports are located on the I/O backplane. USB0 is the bottom connector and USB1 is the top connector. Two Type A ports (USB6 and USB7) are also included on the serverboard (see board layout for locations) See the table on the right for pin definitions.

Universal Serial Bus Ports Pin Definitions (USB0/1, USB6/7)	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	N/A

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## Universal Serial Bus Headers

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

Universal Serial Bus Headers Pin Definitions (USB2/3, USB4/5)			
USB2, USB4		USB3, USB5	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	NC

## Serial Ports

The Wake-On-LAN header is designated JWOL on the serverboard. See the table on the right for pin definitions. You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.

Serial Port Pin Definitions (COM1, COM2)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port. NC indicates no connection.

## Fan Headers

On the JD1 header, pins 1-4 are for an external speaker and pins 3-4 are for the internal speaker. If you wish to use an external speaker, connect it to pins 1-4 to. If you wish to use the onboard speaker, you should close pins 3-4 with a jumper.

Fan Header Pin Definitions (FAN1-8)	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

## Chassis Intrusion

The JOH can be connected to an LED to provide warning of chassis overheat. This LED will also blink to indicate a fan failure. Refer to the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

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## Power LED/ Speaker

On the JD1 header, pins 1-3 are for a power LED and pins 4-7 are for an external speaker. See the table on the right for speaker pin definitions.

Note: The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)		
Pin #	Function	Definition
4	+	Speaker data (red wire)
5	Key	No connection
6		Key
7		Speaker data

## ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse ports are located beside the USB ports. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Ports Pin Definitions	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

## Overheat LED

Connect an LED to the JOH1 header to provide warning of a chassis overheating condition. See the table on the right for pin definitions.

Overheat LED Pin Definitions (JOH1)	
Pin#	Definition
1	+5V
2	OH Active

## SGPIO

The two headers labeled T-SGPIO-1 and T-SGPIO-2 are for SGPIO (Serial General Purpose Input/Output). SGPIO supports serial link interfaces for onboard SATA and SAS ports. Connect the appropriate cables from the backplane to the SGPIO1 and SGPIO2 headers to utilize SATA/SAS management functions on your system.

SGPIO Headers Pin Definitions (T-SGPIO-1, T-SGPIO-2)			
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	NC	8	NC

Note: NC indicates no connection.



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## Power SMB (I2C) Connector

The Power System Management Bus (I2C) header (JPI2C) is used to monitor the power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions (JPI2C)	
Pin#	Definition
1	Clock
2	Data
3	PWR_Fan
4	Ground
5	+3.3V

## IPMB I2C

A System Management Bus header for the IPMI slot is located at IPMB. Connect the appropriate cable here to use the IPMB I2C connection on your system.

IPMB I2C Pin Definitions (IPMB)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

## UID Buttons

There are two Unit Identification (UID) buttons on the serverboard. The Front Panel UID Switch connects to pin 13 of JF1. The Rear UID Switch (SW1) is located next to LAN2. Pushing the UID switch on the Front Control Panel will illuminate both the Rear UID and the Control Panel UID indicators. Push the either switch again to turn off both indicators. These UID indicators provide easy identification of a system that may be in need of service.

## LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.





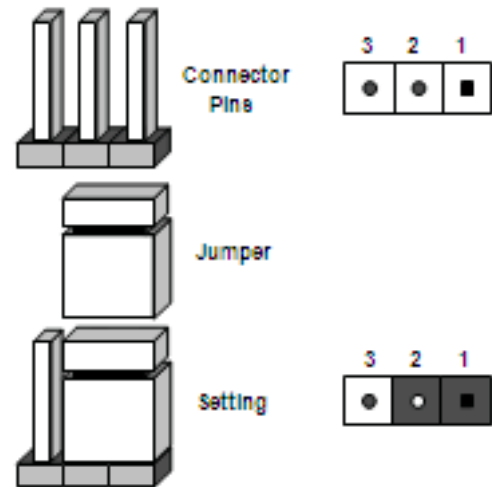
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## 5-9 Jumper Settings

### Explanation of Jumpers

To modify the operation of the mother-board, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations. Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



### CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

#### To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: Do not use the PW\_ON connector to clear CMOS.

### VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

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## LAN Enable/Disable

Change the setting of jumper JPL1 and JPL2 to enable or disable the LAN1 and LAN2 Ethernet ports, respectively. See the table on the right for jumper settings. The default setting is enabled.

LAN Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

## Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS. Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings (JWD1)	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

## VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

## SMB to PCI Express Slots

Jumpers JI2C1 and JI2C2 allow you to connect the System Management Bus (I2C) to the PCI Express slots. The default setting is Open to disable the connection. See the table on the right for jumper settings.

I <sup>2</sup> C to PCI-Exp Jumper Settings (JIC1/2)	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled

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## BMC/PHY Reset

Jumper JPRST1 allow the user to reset the Winbond WPCM450 BMC (Base- board Management Controller) chip and the PHY chip. The default is set to Open for normal operation. See the table on the right for jumper settings.

BMC/PHY Jumper Settings (JPRST1)	
Jumper Setting	Definition
Closed	Reset BMC & PHY
Open	Normal

## ME Mode Select

Closing jumper JP3 allows the user to bypass the SPI flash security and allow the manufacturer to flash the BIOS on the production line. See the table on the right for jumper settings.

ME Mode Select Jumper Settings (JP3)	
Jumper Setting	Definition
Open	Normal
Closed	Manufacture Mode

## ME Recovery

Jumper JP5 allows the user to select the ME Firmware Recovery Mode for BIOS or firmware recovery. When in this mode, only essential system functions will be supported. This mode cannot be used for online BIOS upgrades. See the table on the right for jumper settings.

ME Recovery Select Jumper Settings (JP5)	
Jumper Setting	Definition
Open	Normal
Closed	ME Recovery

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## 5-10 Onboard Indicators

### LAN1/2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each port, one LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the indication associated with the connection speed LED.

### IPMI Dedicated LAN LEDs

In addition to LAN1/LAN2, a dedicated IPMI LAN port is also provided on the motherboard. The yellow LED indicates activity, while the green LED indicates the speed of the connection. See the table at right for more information.

### LE1

An Onboard Power LED is located at LE1 on the serverboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

### LE2

The LE2 LED (located under SW1) is the UID indicator LED. LE2 illuminates when UID is initiated either by the UID button or via IPMI. If initiated a second time, LE2 will turn off. When the LED blinks blue it means the signal was initiated via IPMI. If blue continuously it means the UID button initiated it.

LAN LED Connection Speed Indicator	
LED Color	Definition
Off	No connection or 10 Mbps
Green	100 Mbps
Amber	1 Gb/s



IPMI LAN Activity Indicator LED Settings		
Color	Status	Definition
Amber	Flashing	Active

IPMI LAN Indicator LED Settings	
LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gb/s

Onboard PWR LED Indicator (LE1) LED Settings	
LED Color	Definition
Off	System Off/Power cable not connected
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 State



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## 5-11 SATA Port Drive Connections

### SATA Ports

See the table on the right for pin definitions for the onboard SATA ports.

SATA Port Pin Definitions (I-SATA0 - I-SATA5)	
Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

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## 5-12 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the CDs that came packaged with your motherboard.



### Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. After installing each item, you must re-boot the system before moving on to the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.



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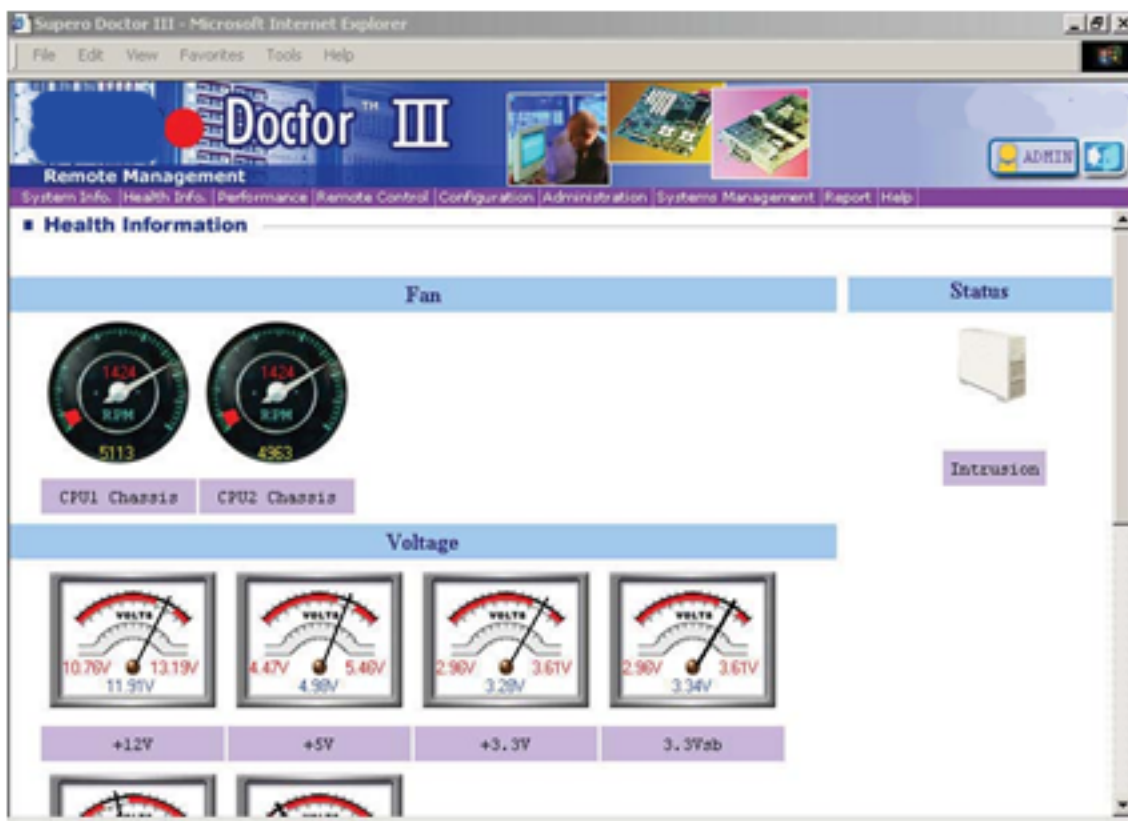
## Doctor III

The Doctor III program is a Web based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Doctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

**Note:** The default User Name and Password for Doctor III is ADMIN / ADMIN.

**Note:** When Doctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Doctor, as the Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall Doctor III.

Doctor III Interface Display Screen (Health Information)





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## Doctor III Interface Display Screen (Remote Control)



## CHAPTER 6 ADVANCED CHASSIS SETUP

This chapter covers the steps required to install components and perform maintenance on the motherboard chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If a step is unnecessary, skip ahead to the step that follows.

### Tools Required

The only tool you will need to install components and perform maintenance is a Philips screwdriver.

### 6-1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD discharge.

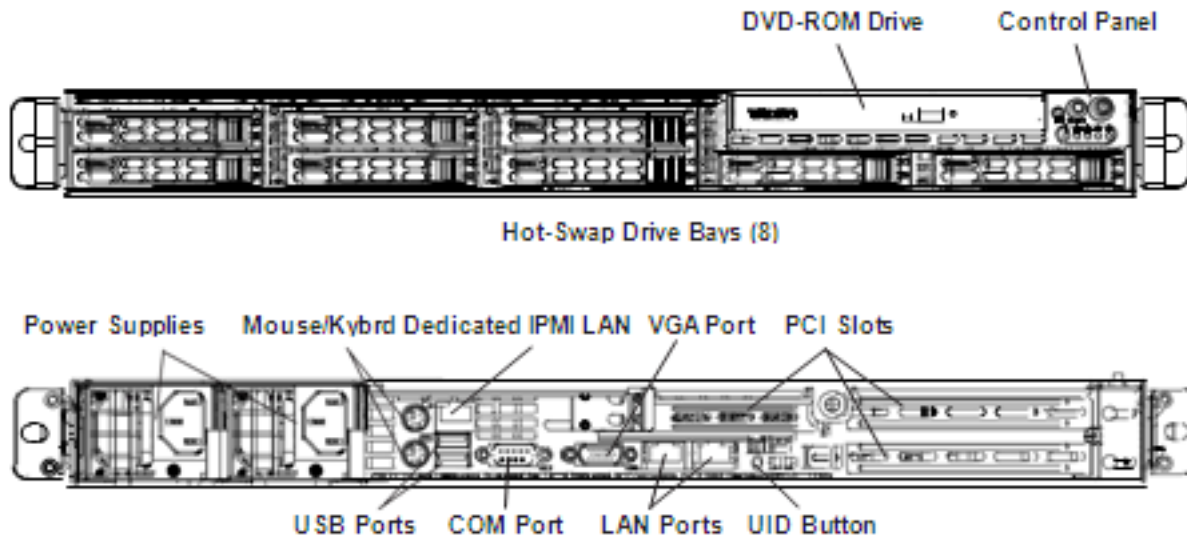
#### Precautions

- o Use a grounded wrist strap designed to prevent static discharge.
- o Touch a grounded metal object before removing any board from its antistatic bag.
- o Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- o When handling chips or modules, avoid touching their pins.
- o Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- o For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

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Figure 6-1. Chassis: Front and Rear Views



## 6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Installation."

## 6-3 System Cooling

Four 4-cm counter-rotating fans provide the cooling for the system. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. The SC113 chassis provides two additional open fan housings, where an additional system fan may be added for optimal cooling.

It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.



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## Adding a System Fan

1. Turn off the power to the system and unplug the power cord.
2. Remove the chassis cover then remove the dummy fan from the fan tray.
3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
4. Connect the fan wires to the fan header on the serverboard.
5. Power up the system and check that the fan is working properly before replacing the chassis cover.

## System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

The embedded system chassis includes four pre-installed fans. Two additional open slots are available so that up to two more fans may be added.

## Replacing a System Fan (Figure 6-2)

1. Open the chassis while the system is running to determine which fan has failed. Never run the server for an extended period of time with the chassis open.
2. Turn off the power to the system and unplug the power cord.
3. Remove the failed fan's wiring from the fan header on the serverboard.
4. Lift the failed fan from the chassis and pull it completely out.
5. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
6. Reconnect the fan wires to the same chassis fan header as the previous fan.
7. Power up the system and check that the fan is working properly before replacing the chassis cover.

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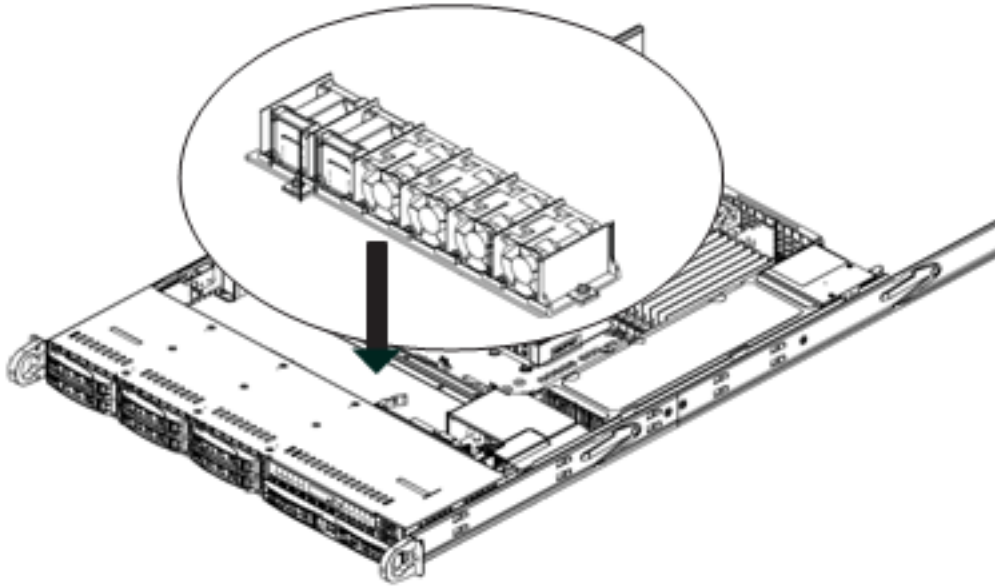


Figure 6-2: Replacing a System Fan  
(shown with optional fan installed)

## 6-4 Drive Bay Installation/Removal

### Accessing the Drive Bays

**Hard Drives:** Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace hard drives. Proceed to the next section for instructions.

**DVD-ROM Drive:** For installing/removing a DVD-ROM drive, you will need to gain access to the inside of the system by removing the top cover of the chassis. Proceed to the "DVD-ROM Drive Installation" section later in this chapter for instructions.

**Note:** Only a "slim" DVD-ROM drive will fit into the server chassis.

### Hard Drive Installation

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

### Installing a Hard Drive into a Drive Carrier (Figure 6-3)

1. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.



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2. Align the drive in the carrier so that the screw holes of both line up. Note that there are holes in the carrier marked "SATA" to aid in correct installation.
3. Secure the drive to the carrier with four screws as illustrated below.
4. Insert the drive carrier into its bay, keeping the carrier oriented so that the hard drive is on the top of the carrier and the release button is on the right side. When the carrier reaches the rear of the bay, the release handle will retract.
5. Push the handle in until it clicks into its locked position

## Removing a Hard Drive (Figure 6-4)

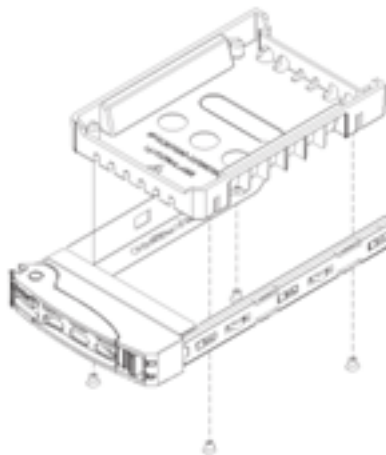
1. To remove a carrier, push the release button located beside the drive LEDs.
2. Swing the handle fully out and use it to pull the unit straight out.

**Note:** Your operating system must have RAID support to enable the hot-plug capability of the hard drives.



**Warning:** Except for short periods of time (swapping hard drives), do not operate the server with the hard drives empty.

Figure 6-3: Installing a Hard Drive into a Carrier

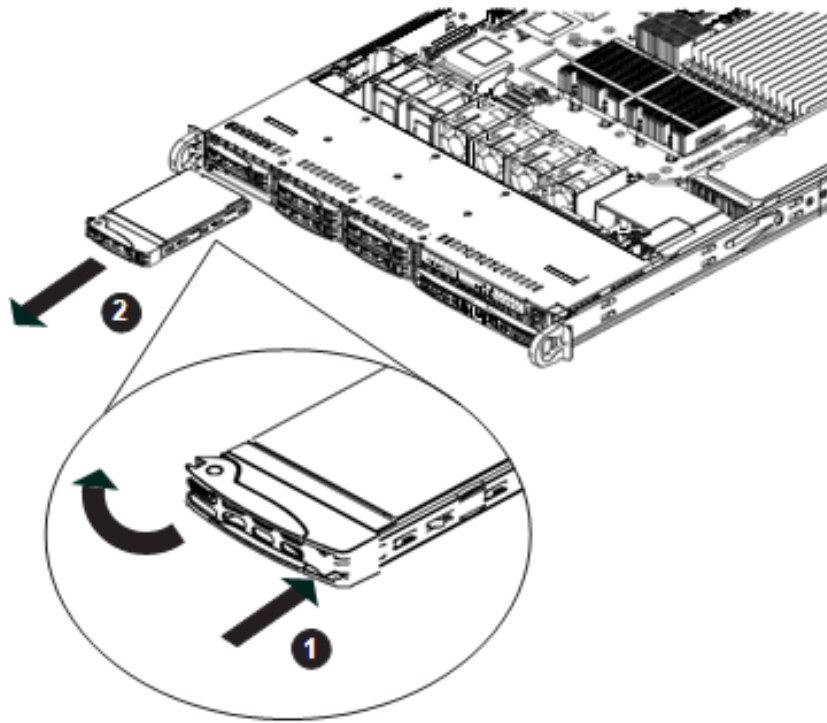




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Figure 6-4. Removing a Hard Drive



### DVD Drive Installation

The embedded system chassis includes a pre-installed DVD-ROM.

#### Installing or Replacing a DVD-ROM Drive

1. Power down the system and if necessary, remove the server from the rack and the front bezel from the chassis.
2. Remove the chassis cover.
3. Unplug the drives power and data cables from the serverboard and/or back- plane.
4. If you are adding a new drive: Remove the mini-bezel (grate) from the drive bay The bezel can be removed by pulling out the hard drive beneath the DVD-ROM, then pulling the mini-bezel forward.

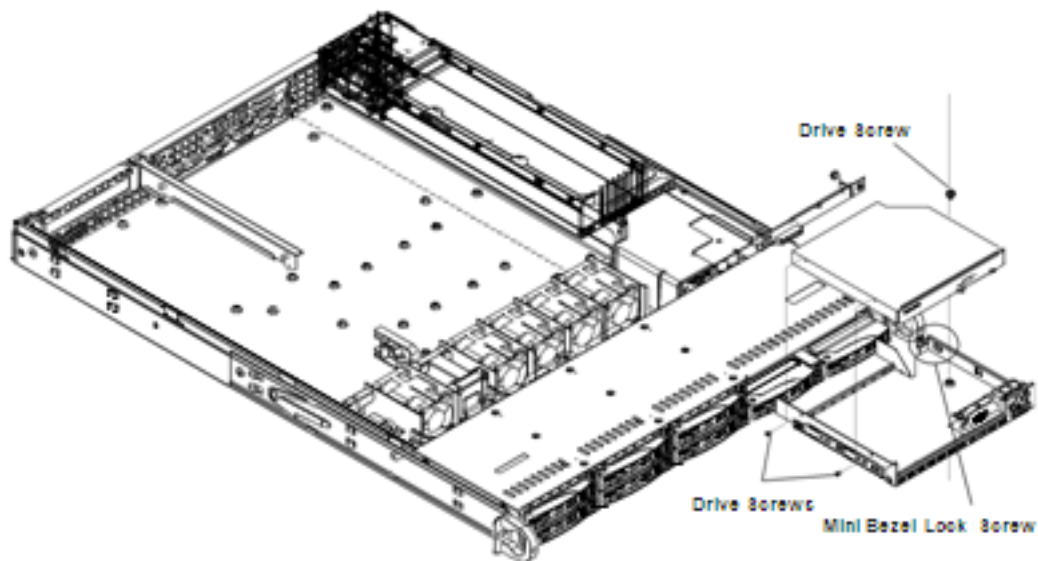
If you are replacing a drive: Locate the locking tab at the rear (left hand side when viewed from the front) of the DVD-ROM drive. Push the tab toward the drive and push the drive unit out the front of the chassis.

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5. Insert the new drive unit in the slot until the tab locks in place.
6. Reconnect the data and power cables.
7. Replace the chassis cover (replace the server in the rack, if necessary) and power up the system.

Figure 6-5. Installing the DVD-ROM Drive



## 6-5 Power Supply

The Acnodes RMC7189 has a 650 watt redundant power supply, which is auto-switching capable. This enables it to automatically sense and operate with a 100V to 240V input voltage. A power on/off switch is included on the back of the unit. This switch should be turned to the off position before removing the power cord when replacing the unit.

If either of the two power supply modules fail, the other module will take the full load and allow the system to continue operation without interruption. The Universal Information LED on the control panel will blink slowly and remain so until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface). The power supply modules have a hot-swap capability, meaning you can replace the failed module without powering down the system.

### Replacing the Power Supply

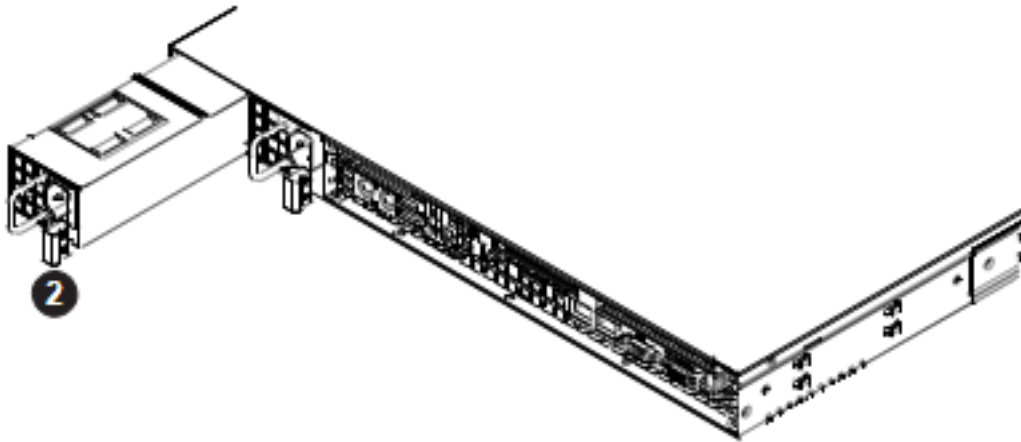
1. Check the LEDs on the power supplies to determine which module has failed.

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2. Unplug the power cord from the failed module.
3. Push the release tab (on the back of the power supply) as illustrated.
4. Pull the power supply out using the handle provided.
5. Replace the failed power module with the same model.
6. Push the new power supply module into the power bay until you hear a click.
7. Reconnect the power cord to the new module.

### Removing/Replacing the Power Supply



# CHAPTER 7 BIOS

## 7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the RMC7189. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

### Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen.

There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called hot keys. Most of the AMI BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in Bold are default settings.

### How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> during system boot.

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## Starting the Setup Utility

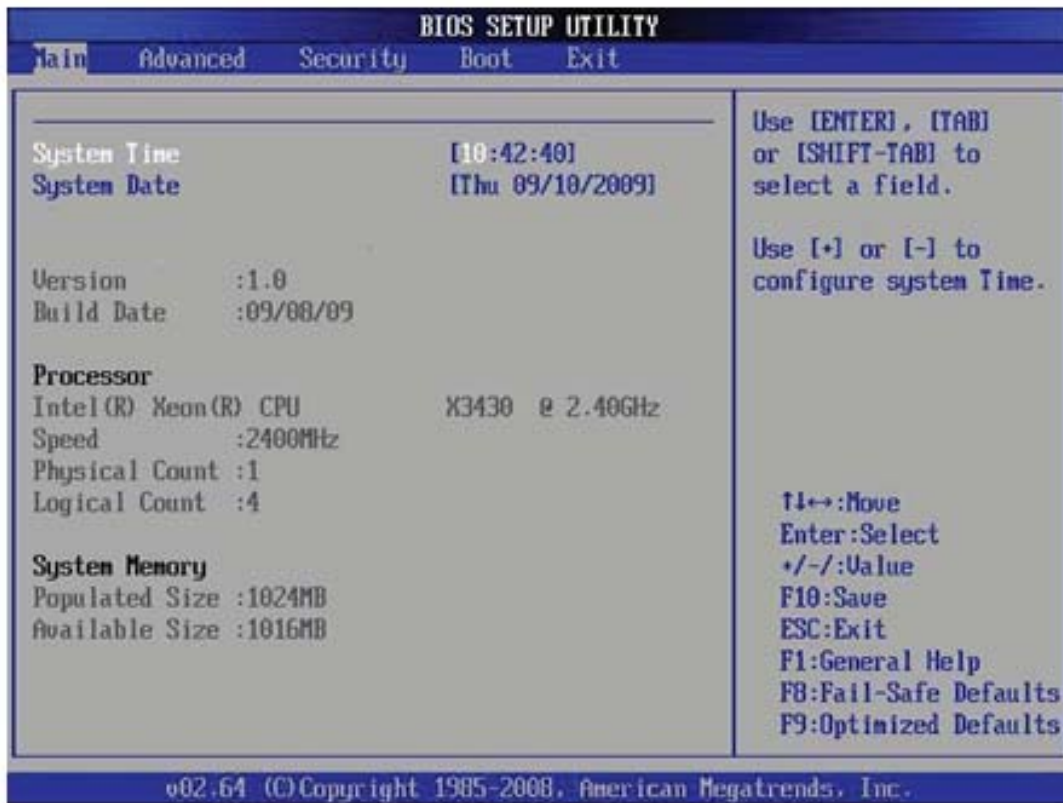
Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.



**Warning!!** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Acnodes be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

## 7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.







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**System Overview:** The following BIOS information will be displayed:

## System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the arrow keys. Enter new values through the keyboard. Press the

<Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

## AMIBIOS

- o Version: This item displays the BIOS revision used in your system.
- o Build Date: This item displays the date when this BIOS was complete.

## Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- o CPU Type: This item displays the type of CPU used in the serverboard.
- o Speed: This item displays the speed of the CPU detected by the BIOS.
- o Physical Count: This item displays the number of processors installed in your system as detected by the BIOS.
- o Logical Count: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

## System Memory

This displays the size of memory available in the system:

- o Populated Size: This item displays the populated memory size detected by the BIOS.
- o Available Size: This item displays the memory size that is available for use.



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## 7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:



### XBOOT Features

#### Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are Enabled and Disabled.

#### Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Enabled and Disabled.

#### AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are Force BIOS and Keep Current.

#### Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and On.



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## **PS/2 Mouse Support**

This feature enables support for the PS/2 mouse. The options are Disabled, Enabled and Auto.

## **Wait For 'F1' If Error**

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and Enabled.

## **Hit 'Del' Message Display**

This feature displays "Press DEL to run Setup" during POST. The options are Enabled and Disabled.

## **Watch Dog Function**

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and Disabled.

## **Restore on AC Power Loss**

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and Last State.

## **Interrupt 19 Capture**

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt

19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are Enabled and Disabled.



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## XProcessor & Clock Options



Warning: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or incorrect DRAM timing may cause system to become unstable. When this occurs, revert to the default setting.

## CPU Ratio

This feature allows the user to use the CPU clock multiplier to multiply CPU speed in order to enhance performance. Select Manual to Manually set the multiplier setting. Select Auto for the BIOS to automatically select the CPU multiplier setting for your system. The options are Auto and Manual.

## Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. Select Disabled to enhance system stability. The options are Disabled and Enabled.

## Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and Enabled.

## Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled.

## Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and Disabled. Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

## Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is Enabled. (Refer to Intel and Microsoft Web Sites for more information.)



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## **Simultaneous Multi-Threading (Available when supported by the CPU)**

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and Enabled.

**Active Processor Cores**  
Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are All, 1 and 2.

## **Active Processor Cores**

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are All, 1, 2, 3 and 4.

## **Intel® EIST Technology**

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Please refer to Intel's web site for detailed information.

The options are Disable: Disable GV3 and Enable: Enable GV3.

## **Intel® TurboMode Technology**

Select Enabled to use the Turbo Mode to boost system performance. The options are Enabled and Disabled.

## **C1E Support**

Select Enabled to use the "Enhanced Halt State" feature. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and Enabled.

## **C-STATE Tech**

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and Enabled.

## **C-State package limit setting**

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are Auto, C1, C3, C6 and C7.



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### **C1 Auto Demotion**

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and Enabled.

### **C3 Auto Demotion**

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and Enabled.

### **DCA Technology**

This feature accelerates the performance of TOE devices. Note: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card. For this motherboard, the TOE device is built inside the ESB 2 South Bridge chip. This feature is supported only by some types of processors (i.e., Intel Nehalem-WS 1S). The options are Enabled and Disabled.

### **DCA Prefetch Delay**

A DCA Prefetch is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], [32], [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

## **XAdvanced Chipset Control**

The items included in the Advanced Settings submenu are listed below:

### **XQPI & IMC Configuration**

QuickPath Interconnect (QPI) is the connection between the CPU and the serverboard's I/O hub. Use this feature to modify speed and power management settings.

#### **QPI Links Speed**

Use this feature to select QPI data transfer speed. The options are Slow-mode, and Full Speed.

#### **QPI Frequency**

Use this option to set the QPI frequency. The options are Auto, 4.800 GT, 5.866 GT, and 6.400 GT.

#### **QPI L0s and L1**

Select Enabled to lower the QPI power state. L0s and L1 are automatically selected by the motherboard. The options are Disabled and Enabled.





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## Memory Frequency

Use this option to force the system memory to run at a different frequency than the default frequency. The available options are Auto, Force DDR-800, Force DDR-1066, and Force DDR-1333.

## Memory Mode

The options are Independent, Channel Mirror, Lockstep and Sparing. Independent - All DIMMs are available to the operating system.

Channel Mirror - The motherboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The motherboard uses two areas of memory to run the same set of operations in parallel.

Sparing - A preset threshold of correctable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

## Demand Scrubbing

Demand Scrubbing is a process that allows the North Bridge to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand- read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and Disabled.

## Patrol Scrubbing

A memory error-correction scheme that works in the background looking for and correcting resident errors. The options are Enabled and Disabled.

## Throttling - Open Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are Disabled and Enabled. If Enabled, the following items will appear:

## Hysteresis Temperature (This feature is available when Closed Loop is enabled.)

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the set DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are Disabled, 1.5oC, 3.0oC, and 6.0oC.

## Guardband Temperature (This feature is available when Closed Loop is enabled.)

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5oC increment. The default is [006]. Press "+" or "-" on your keyboard to change this value.





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## **Inlet Temperature**

This is the temperature detected at the chassis inlet. Each step is in 0.5oC increment. The default is [070]. Press "+" or "-" on your keyboard to change this value.

## **Temperature Rise**

This item allows the user to define the temperature rise parameter of a memory module to be used to improve memory power management. Each setting is in

0.5oC increments. The default setting is [020]. Press "+" or "-" on your keyboard to change this value.

## **Air Flow**

This item allows the user to set the desired speed of air flow to the DIMM modules. Each increment is one mm/sec. The default is [1500]. Press "+" or "-" on your keyboard to change this value.

## **Altitude**

This item allows the user to specify the altitude of the location where the computer is used. For Tylersburg-EP platforms, system memory thermal solution is derated up to 900m. To comply with CPU specifications, BIOS will attempt to adjust and correct DIMM velocity based on the altitude where the system is located in order to improve DIMM thermal performance. Altitude is defined as the number of feet above the sea level where the computer is located. The options are Sea Level or Below, 1~300 (above-), 301~600 (above-), 601~900 (above-),

901~1200 (above-), 1201~1500 (above-), 1501~1800 (above-), 1801~2100 (above-), 2101~2400 (above-), 2401~2700 (above-), and 2701~3000 (above-) the sea level.

## **DIMM Pitch**

Use this feature to specify the distance of physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is [400]. Press "+" or "-" on your keyboard to change this value.

## **Intel VT-d**

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and Disabled.

## **SR-IOV Supported**

Select Enabled to enable Single Root I/O Virtualization (SR-IOV) support which works in conjunction with the Intel Virtualization Technology and allow multiple operating systems running simultaneously within a single computer via natively share PCI-Express devices in order to enhance network connectivity and performance. The options are Enabled and Disabled.



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## NUMA Support

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Enabled and Disabled.

## Intel I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for more other tasks. Available options are Disabled and Enabled.

## Slot SXB2/SXB3 Width

This feature allows the user to change the link width of a PCI slot as specified in order to support a riser or add-on card installed in the slot. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16 as shown in the table below.

Options:	SXB2/	SXB3
x4x4x4x4:	x4x4/	x4x4
x4x4x8:	x4x4/	x8
x8x4x4:	x8/	x4x4
x8x8:	x8/	x8
x16:	x16	

## Slot SXB1 Width

This feature allows the user to change the link width of a PCI slot as specified in order to support a riser or add-on card installed in the slot. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

## Active State Power Management

Select Enabled to start Active-State Power Management for signal transactions between L0 and L1 Links on the PCI Express Bus. This maximizes power-saving and transaction speed. The options are Enabled and Disabled.



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## USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, 2 USB ports, 4 USB ports, 6 USB ports, 8 Ports, 10 Ports and 12 USB ports.

## USB 2.0 Controller

Select Enabled to activate the onboard USB 2.0 controller. The options are Enabled and Disabled.

## Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vice versa. The settings are Disabled, Enabled and Auto.

## BIOS EHCI Hand-Off

Select Enabled to enable BIOS Enhanced Host Controller Interface support to provide a workaround solution for an operating system that does not have EHCI Hand-Off support. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and Enabled.

## XIDE / Floppy Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE Devices and displays the following items:

### SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible, Enhanced.

### Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. The options are IDE, RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear. When the option-AHCI is selected, the item-SATA AHCI will be available.)

### SATA#2 Configuration (Available when the option-IDE is selected.)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and Enhanced.



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## **ICH RAID CodeBase** (Available if RAID is selected above)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are Intel and Adaptec.

## **SATA AHCI** (Available if either RAID or AHCI is enabled under "Configure SATA#1 as" above)

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced program- mers only.)

## **IDE Detect Timeout (sec)**

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and 35.

## **XPCI/PnP Configuration**

This feature allows the user to set the PCI/PnP configurations for the following items:

### **Clear NVRAM**

This feature clears the NVRAM during system boot. The options are No and Yes.

### **Plug & Play OS**

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select No to allow the AMI BIOS to configure all devices in the system.

### **PCI Latency Timer**

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, 64, 96, 128, 160, 192, 224 and 248.

### **PCI IDE Bus Master**

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and Enabled.

### **PCIe IO Performance**

This feature allows the user to configure PCI-E slot settings to enhance perfor- mance. The default setting is 128MB.

### **PCI SERR Function**

PCI SERR (System Error) is for reporting address parity errors, or any other fatal system errors. It is shared among all PCI devices. The options are Disabled and Enabled.



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## **PCI SERR Signal Type (Available when PCI SERR Function is enabled.)**

System Monitoring Interface (SMI) and Non-Maskable Interrupt (NMI) are different signal interfaces in the serverboard that handles system errors. The options are [NMI], and [SMI].

## **PCI-E Slot from SXB1/PCI-E Slot from SXB2/PCI-E Slot from SXB3**

Select Enabled to enable PCI-E SXB1 slot, PCI-E SXB2 slot or PCI-E SXB3 slot. It can also enable Option ROMs to boot computer using a network interface from these slots. (SXB1, a x16 slot, can be configured into two x8 slots. SXB2, a x8 slot, can be configured into two x4 slots.) The options are Enabled and Disabled.

## **Onboard LAN Option ROM Select**

Select iSCSI to use iSCSI Option ROMs to boot the computing using a network device. Select iSCSI to use PXE Option ROMs to boot the computing using a network device. The options are iSCSI and PXE.

## **Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM**

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot the computer using a network interface. The options are Enabled and Disabled.

## **XSuper IO Device Configuration**

### **Uart 2 of Hermon as**

Select COM to configure the onboard COM 2 port as a normal serial port. Select SOL to configure the onboard COM 2 port as a virtual COM port for SOL use. The options are SOL and COM.

### **Serial Port 1 Address/ Serial Port 2 Address**

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, 3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, 2F8/IRQ3, 3E8/IRQ4, and 2E8/IRQ3.



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## **XRemote Access Configuration**

### **Remote Access**

This allows the user to enable the Remote Access feature. The options are Disabled and Enabled.

If Remote Access is set to Enabled, the following items will display:

### **Serial Port Number**

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and COM 2.

### **Serial Port Mode**

This feature allows the user to set the serial port mode for Console Redirection. The options are 115200 8, n, 1; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and

9600 8, n, 1.

### **Flow Control**

This feature allows the user to set the flow control for Console Redirection. The options are None, Hardware, and Software.

### **Redirection After BIOS POST**

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and Always.

### **Terminal Type**

This feature allows the user to select the target terminal type for Console Redirection. The options are ANSI, VT100, and VT-UTF8.

### **VT-UTF8 Combo Key Support**

A terminal keyboard definition that provides a way to send commands from a remote console. Available options are Enabled and Disabled.

### **Sredir Memory Display Delay**

This feature defines the length of time in seconds to display memory information. The options are No Delay, Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.





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## XHardware Health Configuration

This feature allows the user to monitor Hardware Health of the system and review the status of each item when displayed.

### CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU

#### Warning:

1. Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.

2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

o The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

o The Default Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5°C above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

### CPU 1 Temperature/ CPU 2 Temperature/ System Temperature

This feature displays current temperature readings for the CPU and the System. The following items will be displayed for your reference only:

#### CPU 1 Temperature/CPU 2 Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the serverboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the serverboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the serverboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.



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Acnodes has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25oC). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

**Low** - This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The serverboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

**Medium** - The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

**High** - The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems. Note: the system may shut down if it continues for a long period to prevent damage to the CPU.

### Notes:

1. The system may shut down if it continues for a long period to prevent damage to the CPU.
2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at [www.Intel.com](http://www.Intel.com).

**System Temperature:** The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

### Fan1 ~ Fan 8 Reading

This feature displays the fan speed readings from fan interfaces Fan 1 through Fan 8.

The image shows a blue header with a circuit board pattern on the left. On the right, the text 'RMC 7189' is displayed in a large white font, with '1U Rackmount System' in a smaller white font below it.

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## Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select "Disabled, (Full Speed @12V)" to disable the fan speed control function and allow the onboard fans to constantly run at the full speed (12V). The Options are: Disabled (Full Speed), 4-pin (Server), 4-pin (Workstation), 4-pin (Quiet) and 4-pin (Super Quiet).

## Voltage Monitoring

CPU1 Vcore, CPU2 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt.

## XACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

## High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Enabled and Disabled.

## PS/2 KB/MS WakeUp

This feature is used to awaken from Standby mode by a PS/2 mouse or PS/2 keyboard. The options are Enabled and Disabled.

## ACPI Aware O/S

Enable ACPI support if it is supported by the OS to control ACPI through the Operating System. Otherwise, disable this feature. The options are Yes and No.

## ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are Enabled and Disabled.

## APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and Disabled.



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## Headless Mode

This feature is used to enable system to function without a keyboard, monitor or mouse attached. The options are Enabled and Disabled.

## ACPI Version Features

The options are ACPI v1.0, ACPI v2.0 and ACPI v3.0. Please refer to ACPI's website for further explanation: <http://www.acpi.info/>

## XIPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at [www.intel.com](http://www.intel.com).

## IPMI Firmware Version

This item displays the current IPMI Firmware Version.

## Status of BMC Working

The Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This item displays the status of the current BMC controller.

## XView BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.

- o Total Number of Entries
- o SEL Entry Number
- o SEL Record ID
- o SEL Record Type
- o Event Timestamp
- o Generator ID
- o Event Message Format User
- o Event Sensor Type



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- o Event Sensor Number,
- o Event Dir Type
- oEvent Data.

## Clear BMC System Event Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are OK and Cancel.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

## XSet LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

**Channel Number** - Enter the channel number for the SET LAN Config command. This is initially set to [1]. Press "+" or "-" on your keyboard to change the Channel Number.

**Channel Number Status** - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

**IP Address Source** - This feature allows the user to select how an IP address is assigned to a client computer or network device. Select DHCP (Dynamic Host Configuration Protocol) to allow a client (computer or device) obtains an IP address from a DHCP server that manages a pool of IP addresses and network information on a "request and grant" basis. Upon time-out (or lease expiration), the IP address assigned to the client can be reassigned to a new client. Select Static (Static Allocation) to allow the host server to allocate an IP address based on a table containing MAC Address/IP Address pairs that are manually entered (probably by a network administrator). Only clients with a MAC address listed in the MAC/ IP Address Table will be assigned an IP address. The IP Address allocated to the client is on a longer term basis than that assigned by the DHCP mentioned in the other option. The options are DHCP and Static.

**IP Address** - The BIOS will automatically enter the IP address of this machine; however it may be over-ridden. IP addresses are 6 two-digit hexadecimal numbers (Base 16, 0~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

**Subnet Mask** - Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.





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## Gateway Address

The BIOS will automatically enter the Gateway address of this machine; however it may be over-ridden. IP addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

## Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be over-ridden. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

## XSet PEF Configuration

Set this feature to configure the Platform Event Filter (PEF). PEF interprets BMC events and performs actions based on pre-determined settings or 'traps' under IPMI 1.5 specifications. For example, powering the system down or sending an alert when a triggering event is detected.

The following will appear if PEF Support is set to Enabled. The default is Disabled.

**PEF Action Global Control** - These are the different actions based on BMC events. The options are Alert, Power Down, Reset System, Power Cycle, OEM Action, Diagnostic Interface.

**Alert Startup Delay** - This feature inserts a delay during startup for PEF alerts. The options are Enabled and Disabled.

**PEF Alert Startup Delay** - This sets the pre-determined time to delay PEF alerts after system power-ups and resets. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at [www.intel.com](http://www.intel.com). The options are No Delay, 30 sec, 60 sec, 1.5 min, 2.0 min.

**Startup Delay** - This feature enables or disables startup delay. The options are Enabled and Disabled.

**PEF Startup Delay** - This sets the pre-determined time to delay PEF after system power-ups and resets. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at [www.intel.com](http://www.intel.com). The options are No Delay, 30 sec, 60 sec, 1.5 min, 2.0 min.

**Event Message for PEF Action** - This enables or disables Event Messages for PEF action. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at [www.intel.com](http://www.intel.com). The options are Disabled and Enabled.

## BMC Watch Dog Timer Action

Allows the BMC to reset or power down the system if the operating system hangs or crashes. The options are Disabled, Reset System, Power Down, Power Cycle.





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## **BMC WatchDog TimeOut [Min:Sec]**

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are [5 Min], [1 Min], [30 Sec], and [10 Sec].

## **XEvent Log Configuration**

### **View Event Log**

Use this option to view the System Event Log.

### **Mark all events as read**

This option marks all events as read. The options are OK and Cancel.

### **Clear event log**

This option clears the Event Log memory of all messages. The options are OK and Cancel.

### **PCIE Event Log**

Select Yes to activate and display the PCI-Express slot event log. The options are Yes and No.

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## 7-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.



### Supervisor Password

This item indicates if a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

### User Password:

This item indicates if a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

### Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new Supervisor Password.

### User Access Level (Available when Supervisor Password is set as above)

Available options are Full Access: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

The background of the top section is a blue gradient with a semi-transparent image of a server rack on the left side. The text 'RMC 7189' and '1U Rackmount System' is displayed in white on the right side of this section.

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## **Change User Password**

Select this feature and press <Enter> to access the submenu , and then type in a new User Password.

## **Clear User Password** (Available only if User Password has been set) Password Check

Available options are Setup and Always.

## **Password Check**

This item allows you to check a password after it has been entered. The options are Setup and Always.

## **Boot Sector Virus Protection**

When Enabled, the AMI BOIS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and Disabled.

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### 7-5 Boot Settings

Use this feature to configure Boot Settings:



#### XBoot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

o 1st Boot Device - [USB: XXXXXXXXXX]

o 2nd Boot Device - [CD/DVD: XXXXXXXXXX]

#### XHard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).

o 1st Drive [SATA: XXXXXXXXXXXX]

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### XRemovable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

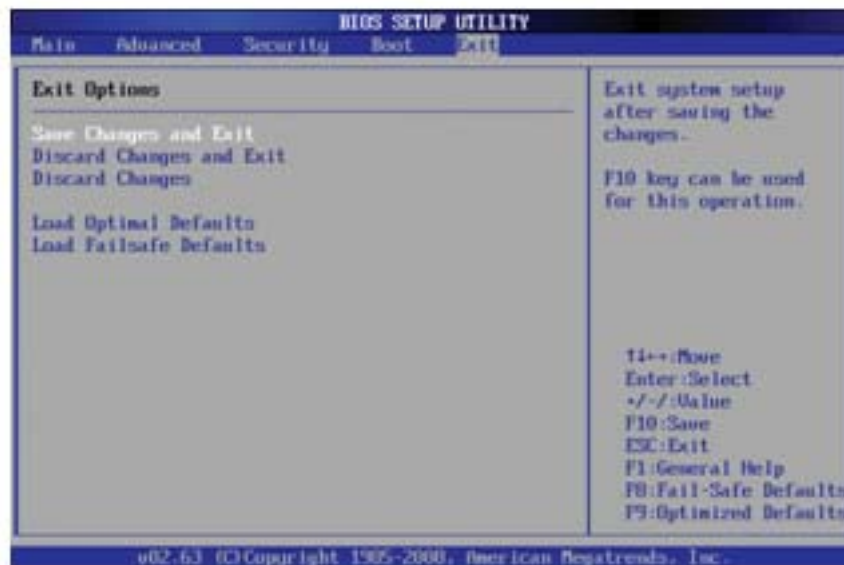
o 1st Drive - [USB: XXXXXXXXXX]/2nd Drive

### XCD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives (i.e., 1st Drive, 2nd Drive, etc).

## 7-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.



### Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.



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## **Discard Changes and Exit**

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

## **Discard Changes**

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

## **Load Optimal Defaults**

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

## **Load Fail-Safe Defaults**

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.



## Appendix A POST Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

BIOS Error Beep Codes		
Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps, 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

## Appendix B Installing the Windows

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides.

### B-1 Installing Windows OS for a RAID System

1. Insert Microsoft's Windows XP/2003/2008/Vista Setup CD in the CD drive, and the system will start booting up from CD.
2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.
3. When the Windows OS Setup screen appears, press "S" to specify additional device(s).
4. Insert the driver diskette "Intel AA RAID Windows XP/2003/2008/Vista Driver for ICH10R" into the floppy drive and press the <Enter> key.
5. Choose the Intel(R) ICH10R SATA RAID Controller from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.
6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.
7. From the Windows OS Setup screen, press the <Enter> key. The Windows OS Setup will automatically load all device files and then, continue the Windows OS installation.
8. After the Windows OS Installation is complete, the system will automatically reboot.



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## **B-2 Installing Windows OS for a Non-RAID Systems**

1. Insert Microsoft's Windows XP/Windows 2003/Windows 2008/Windows Vista Setup CD in the CD drive, and the system will start booting up from CD.
2. Continue with the OS installation. The Windows OS Setup screen will display.
3. From the Windows OS Setup screen, press the <Enter> key. The Windows OS Setup will automatically load all device files and then continue with the OS installation.
4. After the Windows OS Installation is complete, the system will automatically reboot.
5. Insert the Acnodes Setup CD that came with your serverboard into the CD drive during system boot, and the main screen will display.



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## Appendix C Specifications

### Processors

Single or dual Intel® 5500 Series processors in LGA1366 sockets

Note: Please refer to our web site for a complete listing of supported processors.

### Chipset

Intel IOH-36D/ICH10R chipset

### BIOS

32 Mb AMI® SPI Flash ROM

### Memory Capacity

Twelve DIMM sockets supporting up to 96 GB of registered ECC DDR3-1333/1066/800 SDRAM

See the memory section in Chapter 5 for details.

### SATA Controller

Intel ICH10R on-chip controller for six-port Serial ATA (RAID 0, 1 5 and 10 supported)

### Drive Bays

Eight SATA drive bays

One slim DVD-ROM drive

### Expansion Slots

Right side: (optional) 2x Gb LAN ports w/ RSC-R1UU-E8PR riser card and AOC-PG-i2+ add-on card

Left side: one UIO card and one PCI Express x16 slot

### Serverboard

RMC7189 (Proprietary factor)

Dimensions: 12 x 13.05 in (305 x 331 mm)



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## Chassis

RMC7189: SC113TQ-R650 (1U rackmount form factor)

Dimensions (both): (WxHxD) 17.2 x 1.7 x 23.5 in. (437 x 43 x 597 mm)

## Weight

Gross Weight: 33 lbs. (15 kg.)

## System Cooling

4 x 4-cm high performance fans

## System Input Requirements

AC Input Voltage: 100-240V AC auto-range

Rated Input Current: 8A (115V) to 4A (230V)

Rated Input Frequency: 50 to 60 Hz

## Power Supply

RMC7189

Rated Output Power: 650W (Model# PWS-651-1R)

Rated Output Voltages: +5V (25A), +3.3V (12A), +12V (54A), +5Vsb (3A)

## Operating Environment

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-operating Temperature: -40° to 70° C (-40° to 158° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-operating Relative Humidity: 5 to 95% (non-condensing)

## Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"